

1	Title of research	Development and applications of polarized targets for fundamental physics researches	
2	List of Participants (Name and affiliation)	Masataka IINUMA(Hiroshima Univ.), Hiroki HOTTA(Nagoya Univ.), Ikuo IDE(Nagoya Univ.)	
		Kohei ISHIZAKI(Nagoya Univ.), Yuki ITO(Nagoya Univ.), Hideki KOHRI(RCNP)	
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3	Period of research	1/April/2021 - 31/March/2022	
4	Main location of collaboration implementation	Remote only or Mixing of remote and on-site implementation at RCNP or Yamagata Univ.	
5	Publication list (Please include DOI if available)	Articles	K.Ishizaki,et.,al., Polarized Lanthanum Target for the T-violation Search in Slow Neutron Transmission, Proceeding of The 18th international Workshop on Polarized Sources, Targets, and Polarimetry - PoS (PSTP2019) Vol. 379, 061, 2020, DOI: <a href="https://doi.org/10.22323/1.379.0061">https://doi.org/10.22323/1.379.0061</a>
		Talks	K. Ishizaki, et.,al, Formation without twinning in LaAlO3 crystals and investigation on an evaluation method of twinning structure by neutron transmission imaging, JSNS 2020, online(Sendai), 9/Nov/2020
			M. Iinuma, Solid polarized target, invited in the domestic workshop on spin physics "Prospects of spin physics in Japan", online(Matsue), 23/Feb/2021-24/Feb/2021
			I.Ide,et.,al,Present status of development of nuclear polarized La targets for the experiments of T-violation searches, Experimental Nuclear Physics in 76th Annual meeting 2021, the Physical Society of Japan, online, 12/Mar to 15/Mar
		Theses	I.Ide, Studies on the DNP characteristics of target material LaAlO3 crystals toward the NOPTREX experiment, Master thesis FY2020 in Nagoya University
Y.Ito, Crystal growth of target material Nd <sup>3+</sup> :LaAlO3 crystal for a search of violation in time reversal invariance, Graduation thesis Fy2020 in Nagoya University			
6	Description of the results and outputs	<p>We have a weekly meeting on the project with the remote only, or mixing the remote and the face-to-face communication at RCNP. Through the data analysis and the comparison with the model, the relaxation time of Lanthanum and Aluminum nuclear spins has been estimated to be more than 1 hour at 0.1 [K] and in 0.1 [T]. This result has encouraged to investigate a possibility of a low-field DNP in 0.1 [T]. The summarization of the result has been almost finished toward a submission as a paper. Then, we have performed the first experiment with our grown crystals and made an argument on the results at Yamagata University. Although the polarization of about 0.2 % has been small at 1.3[K] in 2.3 [T], this result has become a first significant step toward the 50 % polarization.</p>	